

*inner side of said reflector being formed to be mirror-reflecting, and being
arranged with reference to said lamp that is substance no light beams are emitted directly from the
lamp through said first optical element but in substance only light beams reflected at said reflector
can exit said emission opening through said first optical element.*

REMARKS

Independent claims 1, 10 and 12 have been amended to set forth more clearly the structurally distinguishing features of the subject invention as discussed below.

Claims 1-3 and 6-13 were rejected under 35 U.S.C. §102(b) as being anticipated by Hou et al. (U. S. Patent No. 5,839,823) and claims 4 and 5 were rejected under 35 U.S.C. §103(a) as being unpatentable over Hou et al. It is submitted that all of the claims as now amended, patentably distinguish over Hou et al. and are allowable.

Claim 1 specifies:

“said reflector being shaped and arranged with reference to said lamp that in substance no light beams are emitted directly from the lamp through the optical element but in substance only light beams reflected at said reflector can exit said emission opening through said optical element.”

The significance of this recitation is explained in paragraph [0023], as follows:

“The construction of optical element 14 with the micropism structure 17 brings about, in known manner, an anti-dazzling effect of the light beams for the observer, i.e. a restriction of the exit angle of the light beams 15 out of the luminaire 10. In that no or virtually no light beams are emitted directly from the lamps 11 through the optical element 14, but in substance only light beams 15 reflected at the inner side of the reflector 12 couple into the optical element 14 and then leave this element downwardly, there is achieved a uniform or at least virtually uniform illumination of the entire surface of the optical element 14. This effect is further promoted by means of a diffusely reflecting inner side of the reflector.” (Emphasis added).

While some light rays from the lamp may impinge directly on the optical element 14, those particular light rays impinge at such an angle that they cannot exit at the emission opening through the optical element. By providing a structure in which all of the light beams which exit at the emission opening are first reflected from the reflector, the emitting surface of the optical element is made to provide more uniform illumination.

The patent to Hou et al. does not disclose or suggest a reflector which is shaped and arranged with reference to a lamp such that in substance no light beams are emitted directly from the lamp through the optical element but in substance only light beams reflected at the reflector can exit the emission opening through the optical element, as specified in amended claim 1.

Paragraph 4 of the Official Action mailed July 31, 2002 says that Hou et al discloses "said reflector being shaped and arranged with reference to said lamp that in substance only light beams reflected at said reflector can exit said remission opening through said optical element (fig 33)." This is not correct. Fig. 33 of Hou et al. shows two light beams from the lamp 112 which impinge directly on the optical element 120. One light beam (A) is clearly shown to pass through the optical element. The other light beam, which is undesignated, is reflected off the reflective solid filler between the microprisms. Hou et al. specifically state at Col. 7, lines 19-27:

"Absent a special structure, the light source 112 radiates light towards the light-directing assembly 129 and in other directions as well. Those light rays which travel directly to an input surface 132 of a microprism 122 are reflected as dictated by the equations for calculating R_s and R_p ; the remainder of the light is transmitted through the microprism 122 and ultimately pass through an associated lens 142 and out, as represented by the light ray A." (Underlining added).

Thus, Hou et al. do not disclose a luminaire in which only the light which is reflected off the reflector passes through the optical element. Further, Hou et al. do not disclose a

luminaire in which substantially none of the direct light from the lamp passes through the optical element.

In view of the foregoing, it is submitted that Hou et al. do not anticipate claim 1 as now amended.

It is submitted that it would not have been obvious to modify Hou et al. such that substantially none of the direct light from the lamp passes through the optical element. Firstly, Hou et al. are concerned with efficiency which means to emit as much light as possible from the illuminating system. Hou et al. says nothing about uniformity of illumination, which is the problem solved by applicants' invention. Secondly, it is apparent from Hou et al.'s Fig 33 that direct rays, such as ray A, are intended to pass through the optical element 120.

In view of the foregoing, it is submitted that Hou et al. would not have made the subject matter of claim 1 as a whole obvious. Accordingly, claim 1 as now amended patentably distinguishes from Hou et al. and is allowable.

Claims 2-9 are dependent on claim 12 and patentably distinguish over Hou et al. for the reasons given above. Further, the specific structures defined by these dependent claims provide additional advantages, as can be seen from the specification, as well as additional novelty; and for this reason also claims 2, 3 and 6-9 are patentable over Hou et al.

Independent claim 10 has been amended in the same manner as claim 1. Thus, claim 10 now specifies:

"said inner side of said reflector being formed to be mirror-reflecting, and being arranged with reference to said lamp that in substance no light beams are emitted directly from the lamp through the optical element but in substance only light beams reflected at said reflector can exit said emission opening through said optical element."

Thus, claim 10 as now presented specifies that substantially no light beams

emitted directly from the lamp are emitted through the optical element and in substance only light beams reflected at the reflector exit through the optical element. For the same reasons given in regard to claim 1, claim 10 patentably distinguishes over Hou et al. and is allowable.

Claim 11 is dependent on claim 10 and is allowable for the same reason given above for claim 10.

It is respectfully requested that the rejection of claim 12 as being anticipated by Hou et al. be reconsidered and withdrawn in view of the following comments.

Claim 12 specifies :

“said microprisms of said first optical element having an elongate structure . . . the microprisms of said second optical element having an elongate structure . . . and said microprisms of said second optical element extending transversely to said microprisms of said first optical element.”

The significance of this is that it permits a simpler and therefore more economical construction of the optical element. This is because it is easier to form microprisms that are of elongate structure than it is to form microprisms that are rectilinear, as shown for example, in Fig. 13 of Hou et al. Applicants have discovered that the effect of rectilinear microprisms can be achieved by providing two parallel optical elements each having microprisms of elongate structure, and arranging them so that the microprisms of one element extend transversely to the microprisms of the other element.

Hou et al. neither show nor suggest such an arrangement. As indicated above, and as expressly stated in Hou et al., the microprisms 210 of Fig. 13 are “rectilinear microprisms” (Col. 3, lines 4 and 25). They do not have an elongate structure. None of Hou et al.’s embodiments uses microprisms of elongate structure. Moreover, Hou et al. give no suggestion to arrange two optical elements having elongate structure microprisms in a manner such that the microprisms of one

element extend transversely to those of the other element to produce the effect of a single optical element having rectilinear microprisms. In view of this, it is submitted that claim 12 in its present form patentably distinguishes over Hou et al. and is allowable.

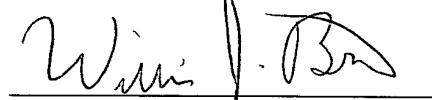
Claim 13 is dependent on claim 12 and patentably distinguishes over Hou et al. for the same reasons as given above for claim 12.

It is submitted that in view of the amendments and comments given herein that claims 1-13 of this application patentably distinguish over the references and that this application is now in condition for allowance.

Further consideration by the Examiner and allowance of this application is respectfully requested.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

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VERSION WITH MARKINGS TO SHOW CHANGES TO CLAIMS

1. (amended) A luminaire comprising:

at least one lamp;

a reflector surrounding the lamp, a side of said reflector facing towards said lamp being reflecting, said reflector being formed with an emission opening for emission of light; and

an optical element arranged in or before the emission opening for deflecting light beams which enter into and exit from the optical element such that light beams exit from said optical element at an exit angle which is smaller than a predetermined limit exit angle, said optical element having a plate-like core of transparent material which is occupied on one side with microprisms formed by furrows, said microprisms having roots from which said microprisms taper,

said reflector being shaped and arranged with reference to said lamp that in substance no light beams are emitted directly from the lamp through the optical element but in substance only light beams reflected at said reflector can exit said emission opening through said optical element.

10. (twice amended) A luminaire comprising:

an elongated lamp;

an elongate reflector configured to surround said lamp, said reflector having an inner side the inner side facing towards the lamp and being formed to be reflecting, said reflector being formed with an emission opening for emission of light; and

an optical element arranged in or before said emission opening, for deflecting

light beams which enter into and exit from said optical element at an exit angle which is smaller than a predetermined exit angle;

 said optical element having, on a light entry side thereof, a plate-like core of transparent material, and having a light exit side which is occupied with microprisms which are formed by furrows and which taper, starting from roots thereof,

 said inner side of said reflector being formed to be mirror-reflecting, and being arranged with reference to said lamp that is substance no light beams are emitted directly from the lamp through the optical element but in substance only light beams reflected at said reflector can exit said emission opening through said optical element.

 said microprisms having an elongate structure and extending transversely of said lamp.

12. (twice amended) A luminaire comprising:

an elongated lamp;

an elongate reflector configured to surround said lamp, said reflector having an inner side the inner side facing towards the lamp and being formed to be reflecting, said reflector being formed with an emission opening for emission of light

 a first optical element arranged to deflect light beams which enter into and exit from said first optical element to exit from said first optical element at an exit angle which is smaller than a predetermined exit angle,

 said first optical element having a plate-like core of transparent material which is

occupied on a light exit side thereof with microprisms and furrows, said microprisms having roots from which said microprisms taper,

 said microprisms of said first optical element having an elongate structure;

 a second optical element arranged to deflect light beams which enter and exit from said second optical element to exit from said second optical element at an exit angle which is smaller than a predetermined limit exit angle;

 said second optical element being of the same construction as said first optical element and being formed with microprisms;

 the microprisms of said second optical element likewise having an elongate structure,

 said second optical element being arranged parallel to said first optical elements,
[and]

 said microprisms of said second optical element extending transversely to said microprisms of said first optical element, and

said inner side of said reflector being formed to be mirror-reflecting, and being arranged with reference to said lamp that is substance no light beams are emitted directly from the lamp through said first optical element but in substance only light beams reflected at said reflector can exit said emission opening through said first optical element.